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Soil Conservation Service

Montana Agricultural Experiment Station

Bozeman, Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow Forecasts as of October 1, 1984

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
Federal Bldg., Rm. 443
10 East Babcock
Bozeman, MT 59715

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The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, Room 443, Federal Building, 10 East Babcock, Bozeman, Montana.

FEDERAL STATE PRIVATE
COOPERATIVE SNOW SURVEYS
Furnisher the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro electric power generation navigation mining and industry
The Conservation of Water begins with the Snow Surveyor

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Summary of 1984 Snow Accumulation

Very little snow accumulated in the mountains during October and November of 1983. Moisture that fell was in the form of rain or snow that melted soon after falling. In late November, temperatures cooled and snow accumulation started throughout all of the higher elevations.

December storms were heavy across the southern part but considerably below average in the northern drainages. The soil moisture levels under the snowpack were higher than average across the southern watersheds and below average in the north. By January 1, snowpacks had accumulated to near average levels in the southern areas while all of the northern parts recorded below average snowpacks.

During January, all areas received below average moisture. By February 1, most of the state showed snowpacks below to well below average.

During February, central mountain ranges received good moisture but other areas continued the below average pattern. Over one-half of the state's water-producing areas had snowpacks of less than 70 percent of average. Areas along the Continental Divide from near Helena to Canada recorded near record low snow water equivalents.

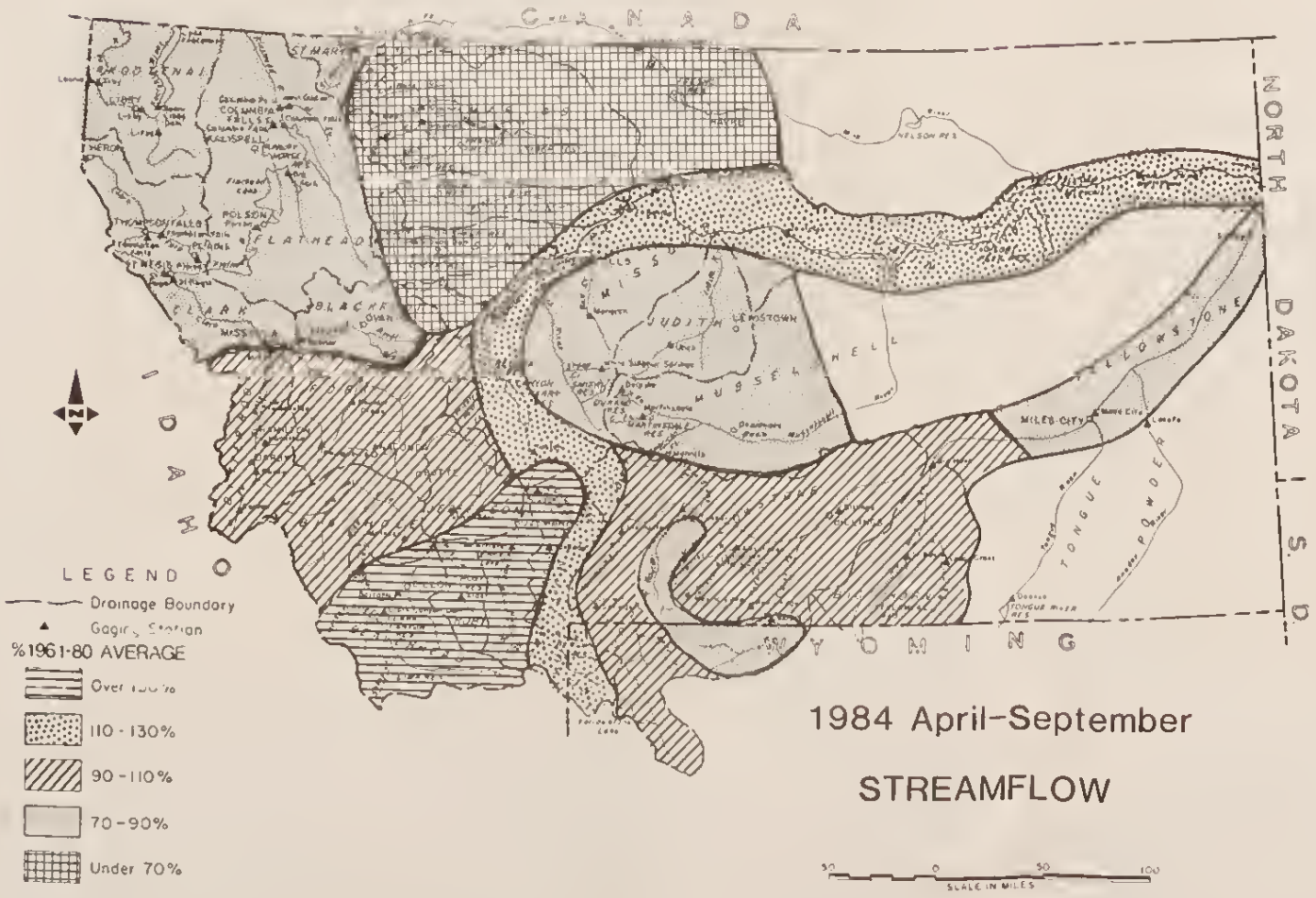
Storms during March again tracked across southern Montana bringing heavy moisture to all areas except for those in the northwest. Some melt was noted at lower elevations.

Late April brought extremely heavy snow around Red Lodge and in other areas across southwest Montana. Storms continued to miss the northwestern areas.

The first half of May alternated between melt and new snow with most snow courses showing some net increase. Melting of the late April heavy snow, combined with some rain, produced heavy runoff in the southwest, particularly the Ruby and Beaverhead River drainages.

The temperatures for the last half of May were cool. The delayed melt helped alleviate some shortages resulting from low snowpacks.

Summer months generally continued the pattern of good moisture across southern areas and deficient supplies across northern and eastern drainages. However, most of the western Montana valleys did receive near average precipitation for the April through September period.



1984 April-September

STREAMFLOW

Based on provisional data provided by:

U.S. Geological Survey
Bureau of Reclamation
National Weather Service
Soil Conservation Service
Montana Power Company
Lima Water Users Irrigation Company
Bitterroot Irrigation District
Pondera County Canal and Reservoir Co.
Butte Water Company
Anaconda Minerals Company
and others

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH September 30, 1984

Basin & Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
	COLUMBIA				
Kootenai	Koocanusa	5,748.2	5,393.0	5,481.0	5,164.0
Flathead	Hungry Horse	3,451.0	3,081.0	3,121.0	3,189.0
	Flathead Lake	1,791.0	1,747.0	1,712.0	1.735.0
	Camas (4)	45.2	16.8	28.0	18.1
	Mission Valley (8)	100.3	22.1	49.2	26.7
Clark Fork	Georgetown Lake	31.0	29.1	30.9	28.3
	Lower Willow Creek	4.9	---	2.6	0.9
	Nevada Creek	12.6	3.5	---	4.0
	Noxon Rapids	334.6	312.1	308.6	326.4
Bitterroot	Painted Rocks	31.7	---	---	22.6
	Como	34.9	---	---	2.5
	MISSOURI				
Beaverhead	Lima	84.0	30.4	55.2	30.0
	Clark Canyon	257.2	---	158.9	120.6
Ruby	Ruby	38.8	---	---	11.8
Madison	Hebgen Lake	377.5	376.0	356.2	336.5
	Ennis Lake	41.0	38.1	37.4	36.7
Gallatin	Middle Lake	8.0	5.2	3.2	3.1
Missouri	Canyon Ferry	2,043.0	1,616.0	1,867.0	1,748.0
	Hauser & Helena	61.9	63.0	63.0	58.9
	Helena Valley	10.4	---	4.4	6.9
	Lake Helena	10.4	10.9	10.9	10.4
	Holter Lake	81.9	81.4	81.0	77.8
	Fort Peck Lake	18,910.0	16,990.0	16,510.0	16,090.0
Smith	Smith River	10.6	---	7.0	5.6
	Newlan Creek	12.4	9.9	9.3	10.1
Musselshell	Bair	7.0	---	1.7	3.2
	Martinsdale	23.1	---	8.6	9.7
	Deadman's Basin	72.2	---	38.9	35.4
Sun	Gibson	99.1	18.2	31.6	29.1
	Willow Creek	32.2	10.3	23.6	19.4
	Pishkun	32.0	19.8	12.1	16.7
Marias	Lower Two Medicine	11.9	---	---	4.6
	Four Horns	19.2	---	---	11.6
	Swift	30.0	11.2	4.1	11.9
	Lake Frances	111.9	13.0	50.8	71.2
Milk	Elwell (Tiber)	1,347.0	---	747.8	606.7
	Beaver Creek	3.5	3.6	3.1	2.1
	Fresno	127.2	17.9	34.2	67.6
	Nelson	66.8	7.7	23.2	42.2
	HUDSON BAY				
St. Mary's	Lake Sherburne	64.3	20.5	10.0	7.6
	YELLOWSTONE				
Stillwater	Mystic Lake	21.0	19.1	21.0	19.5
Clark's Fork	Cooney	27.4	17.4	15.2	13.2
Tongue	Tongue River	68.0	---	10.5	24.8
Bighorn	Bighorn Lake	1,356.0	---	1,062.0	749.0

Average based on 1961-80 period.

1984 SNOW COVER COMPARISONS
(as a percent of average)

	JAN.1	FEB.1	MAR.1	APR.1	MAY 1
COLUMBIA RIVER DRAINAGE					
Kootenai	63	62	59	61	62
Flathead	74	73	68	77	79
Upper Clark Fork	72	64	63	75	91
Lower Clark Fork	81	70	63	64	68
Bitterroot	78	72	68	80	88
MISSOURI RIVER DRAINAGE					
Jefferson	99	81	79	93	108
Madison	111	82	81	86	100
Gallatin	101	86	85	94	99
Missouri Main Stem	81	68	69	83	91
Judith-Musselshell	92	71	80	101	102
Marias-Teton-Sun	56	58	44	52	55
Milk	64	65	63	67	42
YELLOWSTONE RIVER DRAINAGE					
Yellowstone (above Bighorn)	95	75	71	78	89
Bighorn	108	88	77	84	100
Little Big Horn	--	89	78	94	116
Tongue	--	88	80	102	103
Powder	--	93	70	94	102
SASKATCHEWAN RIVER DRAINAGE					
St. Mary's	57	56	56	61	57

Water Supplies Highly Variable

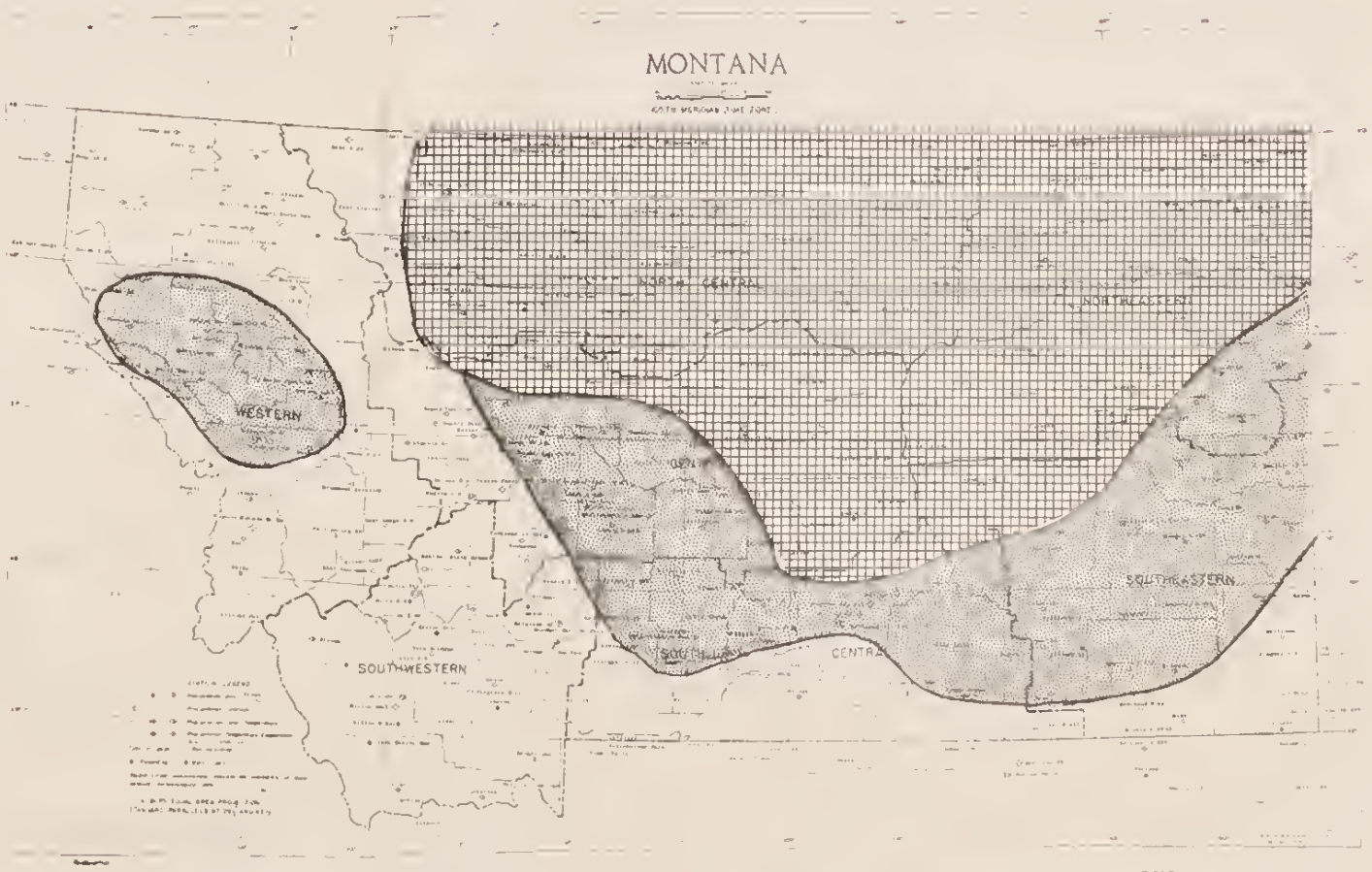
Irrigation water supplies were generally adequate in most of western, southwestern and some areas in extreme southern Montana.

Shortages were moderate around Missoula and over south-central, central and southeastern areas.

Severe shortages were experienced throughout most of the north-central and northeastern sections. Also, water supplies from some storage projects were below average in these areas.

Currently, the moisture levels in watershed soils are average or above in most southern drainages and throughout the southwestern areas including the headwaters of the Bitterroot and Upper Clarks Fork Rivers.

All other areas generally have below average soil moisture reserves.



MID AND LATE SEASON
IRRIGATION WATER SUPPLIES FROM UNREGULATED STREAMS
1984 SEASON

Source: SCS

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